Bridge Street Bridge Spanning Milwaukee River on Bridge Street Village of Grafton Ozaukee County Wisconsin HAER No. WI-92

HAER

WIS

45-GRAF,

L-

# PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record National Park Service Great Lakes System Office 1709 Jackson Street Omaha, Nebraska 68102-2571

# HAER WIS 45-GRAF,

### HISTORIC AMERICAN ENGINEERING RECORD

#### **BRIDGE STREET BRIDGE**

Location:

Bridge Street over the Milwaukee River

Village of Grafton, Ozaukee County, Wisconsin

USGS Cedarburg Quadrangle, Universal Transverse Mercator Coordinates:

Zone 16 Easting 423050 Northing 4796420

Present Owner:

Village of Grafton

Present Use:

Vehicular bridge

Significance:

The Bridge Street Bridge is a single span, single lane Pratt through truss that was erected in 1888. Built by the Wisconsin Bridge and Iron Company, it was identified in *Cultural Resource Management in Wisconsin* (the state's cultural resource management plan) as one of only six pre-1895 examples of that bridge type. As well, *Cultural Resource Management* identified the Wisconsin Bridge and Iron Company as a prolific bridge builder in the state. Indeed, the firm built five of the six aforementioned pre-1895 bridges. With its integrity very much intact, and the fact that no more than four of the six bridges previously cited exist today, the Bridge Street Bridge is significant as an excellent and rare example of an early Pratt through truss that was built by an important Wisconsin bridge building company.

### PART I. HISTORICAL INFORMATION

## A. Physical History:

1. Date of erection: ca. 1888<sup>2</sup>

2. Architect: Unknown

3. Original and subsequent owners: Public ownership.

<sup>&</sup>lt;sup>1</sup>Barbara Wyatt, ed., Cultural Resource Management in Wisconsin, Volume 2 (Madison: State Historical Society of Wisconsin, Historic Preservation Division, 1986), Transportation, 12/13, 12/23.

<sup>&</sup>lt;sup>2</sup>Bridge Street Bridge Plate.

- 4. Builder: Wisconsin Bridge and Iron Company<sup>3</sup>
- 5. Alterations and additions: The historical integrity of this structure is generally good, despite a welded face plate on an inclined endpost, a modern guard rail and chain link utilized to keep people away from the railings

#### B. Historical Context:

#### COUNTY & LOCAL AREA HISTORY

The Town of Grafton, with which the early history of the Village of Grafton was closely associated, was created on 26 January 1846. Its first settlers are thought to have been John Drake and Timothy Wooden, both of whom arrived between 1837 The town's development began in 1841, when a dam across the Milwaukee River and an adjoining sawmill were built. Early commercial activity included clearing the land of its native Sugar Maple, Basswood and Elm trees, cutting the trees into cordwood and selling the timber to operators of lake steamers at the nearby Port of Ulao. Construction within the town was well underway by the mid-1840s, when the "Stone Block" was built. Erected by Phineas M. Johnson, Jacob Adreana and William T. Bonniwell, it served for a time as the county courthouse and jail. With the 1847 chartering of a road that was to run from Ulao, through Grafton and Hartford, to the Wisconsin River, it seemed that the town and its growing settlement on the Milwaukee River would be on a major east/west thoroughfare. Perhaps to capture the anticipated traffic on that road--only three miles of which were built--or to serve travelers who used the Sheboygan and Milwaukee stage line, Grafton had two hotels by 1848: the Wisconsin House and the Grafton House.4

Grafton's industrial development, which started with the 1841 sawmill, received a major boost in 1846 with the construction of a gristmill, brewery, lime kiln and another dam that was located downriver from the original. With regard to the gristmill, one source indicates that by 1880, the mill had "five runs of stones, all the modern improvements, and a capacity for the manufacture of one hundred barrels of flour per day. The products find a constant sale to the bakers of Milwaukee, the brand, 'White Lily,' being a favorite with the trade." In 1879, it was observed that the gristmill provided the town's "staple trade." Additional mid-to-late nineteenth century industries included the 1874 Ormsby Lime Company and the 1880 woolen mill. To

<sup>3</sup>Ibid.

<sup>&</sup>lt;sup>4</sup>History of Washington and Ozaukee Counties, Wisconsin (Chicago: Western Historical Company, 1881), 526-27; Grafton Wisconsin: A Story of Industrial Progress (Grafton, WI: The Village of Grafton, 1952[?]), n.p.

be sure, this industrial development was greatly facilitated by the arrival of the railroad in 1871.5

The town evolved very much as a "central place," and offered a number of services to the surrounding area. In 1901, for instance, the 478 residents of the town provided farmers with a creamery, grain elevator and gristmill, as well as blacksmith shops, harness and wagon making shops and livestock dealerships. Travelers could take advantage of the Grand Central Hotel, the Hotel Mueller or the Robert E. Schabel Hotel, in addition to several saloons. Other town services and commercial ventures included physicians, dentists, general stores and hardware stores, among others.<sup>6</sup>

The Bridge Street Bridge evolved within this general historical context to provide access across the Milwaukee River.

#### TRUSS BRIDGES IN WISCONSIN

The two most commonly found types of truss bridges are the Pratt and Warren. These two classifications are further subdivided into pony or low trusses, overhead or through trusses and deck trusses. The Warren truss, which two British engineers patented in 1840, placed nominal stress on the vertical members, while the diagonals served as both tension and compression members. Caleb and Thomas Pratt patented the Pratt truss in 1844, incorporating vertical compression members and diagonal tension members. During the nineteenth century, the Pratt truss seemed to be more popular because it used less iron and was easier to erect. In the 1870s, numerous variations in the Pratt design were introduced for long span bridges. To save money and material, engineers "bent" the top chord into a polygonal configuration, thereby creating a Parker truss. If the top chord had exactly five sides, it was called a "camelback" truss. The increased live loads of railroad locomotives and rolling stock necessitated further design innovations. The addition of substruts and/or subties greatly fortified truss bridges and transformed a Pratt into a Baltimore and a Parker into a Pennsylvania truss--the latter considered a "major advance in strengthening the Pratt truss." Another development which sparked much debate around the turn-ofthe-century involved the merits of pin connections versus riveted connections for main truss members. Proponents of riveted bridges cited the advantages of increased structural rigidity and the reduction of damaging vibrations; advocates of pinconnected bridges emphasized the theoretically correct stress distribution and the

<sup>&</sup>lt;sup>5</sup>Washington and Ozaukee Counties, 528, 530-31; Grafton Wisconsin, n.p.; Wisconsin State Gazetteer and Business Directory, 1879 (Milwaukee: William Hogg, 1879), 189.

<sup>&</sup>lt;sup>6</sup>Polk's Wisconsin State Gazetteer and Business Directory, 1901-1902 (Chicago: R.L. Polk & Co., 1901), 374-75.

BRIDGE STREET BRIDGE HAER NO. WI-92 Page 4

smaller amount of required metal. Although no dramatic resolution occurred, a compromise of sorts was reached in the early twentieth century. Riveted bridges were designed with less duplication of members, and pin-connected bridges, suitably detailed, were still accepted for long span highway bridges.<sup>7</sup>

These developments affected Wisconsin bridge construction, but other circumstances were equally important. Until the latter nineteenth century, individual bridge companies were largely responsible for bridge design. Consequently, there was little, if any, standardization of design, although Pratt truss bridges seemed to predominate. Indeed, the state's oldest truss bridge, the 1877 White River Bridge in Burlington, is a Pratt. The Good Roads Movement of the late 1890s and early 1900s, however, prompted a dramatic shift with regard to bridge design by promoting greater involvement on the part of local officials and, especially, the state government. In 1907, the state legislature established a Highway Division with the Wisconsin Geological and Natural History Survey to conduct experiments in road design and to provide professional advice to local governments about specific projects.<sup>8</sup>

The following year, Wisconsin voters overwhelmingly removed the greatest obstacle to creating a progressive statewide system of bridge and highway construction by eliminating the state's constitutional prohibition against direct state aid to transportation projects. In 1911, the legislature made its first appropriation for highway improvements. In addition, it transformed the Highway Division into an autonomous State Highway Commission (SHC), responsible for overseeing the expenditure of state funds for the development of a state highway network.<sup>9</sup>

The SHC emphasized the use of standardized plans for various types of bridges and culverts. Prior to this time, metal truss bridges dominated crossings of all lengths. After 1911, however, the SHC promoted the construction of girder, beam or slab spans of steel and/or concrete for short crossings (less than thirty-five feet). The SHC particularly favored concrete spans, citing the advantages of lower cost, greater compatibility with aesthetic treatment and greater adaptability to remodeling, especially in terms of roadway widening. Despite its predilection for concrete bridges, the SHC continued to design truss bridges for spans of thirty-six feet or more. The riveted Warren became the state's standard pony design. Indeed, this

<sup>&</sup>lt;sup>7</sup>Jeffrey Hess, Robert M. Frame, III, Robert S. Newbery and John N. Vogel, "Bowen Mill Bridge," Historic American Engineering Record (HAER) Report, HAER No. WI-67 (1992): 3-5. On file at the Library of Congress, Washington, D.C.

<sup>8</sup>Ibid., 5-6.

<sup>9</sup>Ibid., 7.

design became the state's most common type of highway truss bridge. Of the approximately 450 Warren trusses in the state in 1980, over four-fifths were riveted pony trusses built according to SHC standard plans. The SHC also drafted a standard plan for riveted, overhead Pratt trusses. In the first three and one-half years of its work, the SHC designed over fifteen hundred bridges of all types. Practically all the local bridges in the state during these years were either designed by the SHC or were based on SHC standard plans. The SHC continuously revised its truss designs, drawing upon the latest engineering information. In the 1930s, the SHC made a major commitment to keeping its standardized plans up to date by dropping the Pratt design in favor of the Warren for all overhead truss configurations. Although concrete designs eventually dominated bridge construction, metal truss bridges remained cost effective in many situations. Consequently, the SHC continued to design truss bridges until well after World War II.<sup>10</sup>

The number of highway truss bridges in Wisconsin has dwindled substantially over the years. Under the sponsorship of the State Historic Preservation Office (SHPO) of the State Historical Society, George Danko initiated the first systematic study of Wisconsin truss bridges in 1976. By 1980, when WisDOT established the Historic Bridge Advisory Committee (HBAC), seventeen bridges had been listed or found eligible for listing on the National Register of Historic Places. The HBAC pursued the statewide inventory of truss bridges, which then accounted for approximately one-tenth of the state's 10,386 surviving highway bridges built before 1950.

The HBAC identified an initial pool of 996 pre-1941 truss bridges that represented seventeen structural types. The HBAC screened this pool to identify the following for each truss type: those bridges which had the earliest known construction dates; those in the best condition; bridges with the best available historical data; and those with the most noteworthy features. Also considering bridges in park settings, this winnowing process reduced the initial pool to 247. The most significant bridges within each truss category were determined by applying criteria--modified as necessary--that were developed in a Virginia study. The evaluation process yielded a final group of fifty-three bridges deemed potentially eligible for the National Register. Historians Jeffrey A. Hess and Robert M. Frame, III, contracted to complete a field survey and compile historical data for those bridges in 1986. The final survey totaled fifty-four bridges, including two already listed on the National

<sup>10</sup> Ibid., 7-8.

<sup>11</sup>Ibid., 8-9.

Register (P-18-720 and P-53-162).12

#### THE BRIDGE STREET BRIDGE

Despite the fact that Cedarburg was immediately to the south. Grafton was surrounded on the west, north and east by farms. And for the sake of the Bridge Street Bridge, it is important to note that the gristmill, railroad and much of the town were on the west side of the Milwaukee River. That meant that M. Musbach, C. Jonas, W. Kirst, M. Port and E. Miller, along with all the others who had farms east of the village, had to cross the river to take advantage of the town's services. 13 Accordingly, Grafton has a long history of building bridges across the Milwaukee River. The first evidence of a bridge comes in an 1852 Milwaukee Sentinel article. "The Town of Grafton has shown much public spirit this year in the building of bridges--two fine and durable structures across the Milwaukee River, at a cost of nearly \$800. One of them is built a short distance above the Grist Mill, formerly run by S.H. Vandercook, but now, to good satisfaction, by Mr. Cotton." The article further notes that another bridge was built near the "Turning and Bedstead Establishment," farther downriver. 14 It was the bridge upriver from the gristmill that was an immediate predecessor to the present Bridge Street structure. Perhaps because of deterioration, or the inability to handle growing traffic or a combination of the two, the 1852 bridge was replaced in 1874 when the State of Wisconsin authorized the village to borrow \$1,200 to build a new bridge at Bridge Street. 15

What specific fate befell the 1874 bridge is unknown, but it is evident that this structure was replaced in 1888 by the present bridge because the former was "getting old and used up." To create public sentiment for a new bridge, a petition was circulated in the village for a special town meeting that would discuss the project. The meeting was called for 20 September 1888. The bridge was presumably approved at that time, because contracts were let in October:

The contract for building a new bridge in the place of the old one, was

<sup>12</sup>Ibid., 9-10.

<sup>&</sup>lt;sup>13</sup>Map of Washington and Ozaukee Counties (Milwaukee: G.V. Nash and M.G. Tucker, 1873), map.

<sup>&</sup>lt;sup>14</sup>Milwaukee Sentinel, 28 December 1852.

<sup>15</sup> The Laws of Wisconsin... In the Year 1874 (Madison: State of Wisconsin, 1874), 16.

<sup>&</sup>lt;sup>16</sup>Port Washington (Wisconsin) Weekly Star, 8 September 1888.

BRIDGE STREET BRIDGE HAER NO. WI-92 Page 7

given last week to the Wisconsin Bridge & Iron Co., of Wauwatosa, Wis., for a consideration of \$2,900 to be completed on or before December 10th 1888. The contract for the mason work to build the abutments was given to George Koetterer of our village for a consideration of \$347. Mr. Koetterer will commence the work at once. Thus the bridge will come considerably to over \$3,000.<sup>17</sup>

The Wisconsin Bridge and Iron Company was established by Friederich (Fred E.) and Berthold Weinhagen in 1887 or early 1888.<sup>18</sup> The two brothers ran the company until Berthold left in 1900.<sup>19</sup> Friederich, however, continued as the president of the firm until 1909.<sup>20</sup>

The Wisconsin Bridge and Iron Company was incorporated on 23 January 1891 by Berthold Weinhagen, William Hinrichs and Herman A. Wagner. With capital stock of \$100,000, the company contracted for and built bridges. It also manufactured general iron work. The firm was initially located in Wauwatosa, a community west of Milwaukee, although company officials agreed in 1892 to build an extensive plant in the new suburb of North Milwaukee. The main building, which was to be built in 1893, was to be 200 feet by 300 feet and built of iron the company produced. In addition to the main building, several smaller buildings were needed--including offices, paint shops and storerooms. The company spent \$45,000 on buildings and \$40,000 on machinery. The plant continued to operate at this location until 1929, when it moved to North 35th Street, Milwaukee. In 1904, the stockholders approved increasing the capital stock to \$300,000. Business continued to expand; six years later, company stock value increased to \$500,000. By 1936, the company was worth \$1,000,000. The Wisconsin Bridge and Iron Company established two branch

<sup>&</sup>lt;sup>17</sup>Weekly Star, 8 September 1888; 13 October 1888.

<sup>&</sup>lt;sup>18</sup>A city directory listing makes no distinction as to whether either brother assumed a higher status or rank in the newly formed company. See *Wright's Directory of Milwaukee*, 1887 (Milwaukee: Alfred G. Wright, 1887), 822. In contrast to the reference in the 1887 city directory, it should be noted that the new company was not mentioned in the *Milwaukee Sentinel* until 24 April 1888, at which time George Weinhagen was cited as the firm's organizer. *Milwaukee Sentinel*, 24 April 1888.

<sup>&</sup>lt;sup>19</sup>Berthold is listed in the 1910 directory; however, no occupation is listed. Thus, his employment following his departure from the Wisconsin Bridge and Iron Company remains vague. Wright's Directory of Milwaukee, 1910 (Milwaukee: Alfred G. Wright, 1910), 1604.

<sup>&</sup>lt;sup>20</sup>It was at this time that Friederich became president of the A. George Schultz Company, a Milwaukee paper and folding box manufacturer. Friederich was familiar with the Schultz Company since a relative, George Weinhagen, had been working there since at least 1887. It is unclear if George was a sibling or a more distant relative. Wright's Directory of Milwaukee, 1887, 822; Wright's Directory of Milwaukee, 1909 (Milwaukee: Alfred G. Wright, 1909), 1348.

facilities in the state: one in Oxford and the other at Antigo. The Oxford structures division manufactured farm building packages. The company became one of Wisconsin's largest structural steel fabricating firms before it ceased operations in 1983.<sup>21</sup> In addition to the Bridge Street Bridge, the company is known to have built bridges in the following Wisconsin towns or villages: Fredonia (Ozaukee County), Turtle (Rock County) and Neillsville. The firm was also selected to build a bridge across the Wisconsin River in Tomahawk in 1889.<sup>22</sup>

Clearly, the Bridge Street Bridge was one of the earlier structures erected by the Wisconsin Bridge and Iron Company. Despite the fact that the new Grafton bridge was not completed by the anticipated date, a January 1889 newspaper article recounts that "work on the new bridge is progressing satisfactorily. The old bridge has been taken down, and now the new one is being put in its place. Fortunately the river is frozen to such a degree as to be strong enough to bear the teams driving over it, and thus no great inconvenience is felt."<sup>23</sup>

Unlike the bridges that previously spanned the river at the site, this bridge remained in service for over one hundred years. Despite the mention of another bridge being built across the river in 1852, historic maps indicate that, for at least some time, the Bridge Street Bridge was the only one that crossed the Milwaukee River in Grafton. This is evident from a 1915 map. Other plats, however, such as an 1892 and a 1913 map, clearly indicate the presence of another bridge immediately north of the Bridge Street Bridge. It may have been the location immediately north of the gristmill and the resulting easy access to the mill that made the Bridge Street site important. What is clear, nevertheless, is that the river crossing was deemed significant enough to keep a structure at this site for about 150 years, 105 of which were facilitated by the present Bridge Street Bridge.

<sup>&</sup>lt;sup>21</sup>Wisconsin Bridge and Iron Company, Articles of Incorporation and Amendments (Corporation Division, Secretary of State, Madison, Wisconsin); *Milwaukee Sentinel*, 24 April 1888; "Ready to Begin Work," *Evening Wisconsin*, 24 September 1892; "New Leader At Steel Firm," 31 January 1973, Clipping File: "Wisconsin Bridge and Iron Company," on file at the Milwaukee County Historical Society, Milwaukee, WI. This latter article states that the company was 102 years old in 1973, but no record of the firm starting in 1871 or 1870 was found.

<sup>&</sup>lt;sup>22</sup>Wyatt, ed., Cultural Resource Management, Vol. 2, Transportation, 12/13; Milwaukee Sentinel, 13 January 1889.

<sup>&</sup>lt;sup>23</sup>Weekly Star, 5 January 1889.

<sup>&</sup>lt;sup>24</sup>Plat Book of Washington & Ozaukee Counties, Wisconsin (Des Moines: Northwestern Publishing Company, 1915).

<sup>&</sup>lt;sup>25</sup>Plat Book of Washington & Ozaukee Counties, Wisconsin (Minneapolis: C.M. Foote, 1892); Map of Ozaukee County, 1913 (Delavan, WI: Hennessey & Company, 1913).

#### PART II. ARCHITECTURAL INFORMATION

#### A. General Statement:

- 1. Architectural character: The Bridge Street Bridge was built in 1888. It is a seven-panel, Pratt through truss bridge.
- 2. Condition of fabric: The historic fabric of this bridge is generally good. Structurally, however, individual truss members have experienced a severe amount of section loss, which required that the bridge be closed in the 1980s to all but pedestrian traffic.

## B. Description:

The Bridge Street Bridge is 110 feet 9 inches long and carries a 16 foot 1.5 inch, single lane traffic deck. With a 6 foot walkway on the north side, and a .75 inch gap between the walkway and the traffic deck, the overall width of the structure is 22 feet 5 inches. Resting on a rock/concrete abutment on the east and a rock/stone block/concrete abutment to the west, the traffic deck is carried by six floor beams, each of which is a built-up "I" beam that is fabricated from plates and 2.75 inch angles. The beams taper from their centers and are 12.5 inches by 6.5 inches at the ends. Perpendicular to the floor beams and extending from beam to beam are the deck stringers. Seventeen 13.5 inch by 3 inch stringers support the traffic deck, while four slightly smaller stringers carry the walkway. The bottom lateral bracing is comprised of 1.12 inch eyebars with screw shackles. The deck is timber with steel plate overlays down the middle.

Floor beams one and six are hung from hip verticals of 2 inch by 1 inch rectangular bars, while beams two and five are hung from double 6 inch channel intermediate verticals with lacing front and back (overall dimensions are 9.75 inches by 6 inches). Floor beams three and four are hung from double 5 inch channel intermediate verticals, also with lacing front and back (overall dimensions are 9.5 inches by 5 inches). The inclined endposts and the top chords are 12 inches by 8.5 inches. Each has two channels that are connected with face plates on the front and 4 inch by 12 inch plates placed every 38 to 40 inches on the back. Top lateral bracing is comprised of .75 inch rods. The top struts and sway bracing are double, back-to-back, 2.75 inch angles with cross lacing. Portal struts and portal bracing are fabricated from back-to-back, 3 inch angles. Additional portal bracing, the center part of which resembles a "W," is constructed of what appear to be single, 3 inch angles.

Diagonal member dimensions vary with each panel. Those in panels two and six consist of paired, 2.5 inch by .87 inch rectangular bars, while those in panels three and five are paired, 2 inch by .68 inch bars. Diagonals in panel four are pairs of 1 inch by .75 inch bars with intermediate screw shackles. Bottom chords are paired, 1.81 inch by .87 inch, rectangular eyebars.

All major joint connections are pinned.

Little ornamentation is apparent on the Bridge Street Bridge. The most ornamental feature appears to be the walkway railing. Supported by cylindrical posts at each end and intermediate posts of four 1.25 inch angles placed in a "+" fashion, the top rail is 4.5 inches wide and .87 inches thick. The bottom rail consists of paired, 1.25 inch angles. The primary elements of the railing fence are three symmetrically placed, horizontal courses of 1.5 inch by .18 inch rectangular bars. Diagonal members of the fence are 1.25 inch by .12 inch bars that, when taken with the horizontal bars, create a lattice effect.

## C. Setting:

Located in the Village of Grafton, where Bridge Street crosses the Milwaukee River, the Bridge Street Bridge is several hundred yards south of the present STH 60 bridge crossing. It is generally oriented on an east northeast/west southwest axis, and connects a commercial/residential area on the west with a residential neighborhood on the east.

The commercial area immediately southwest of the bridge consists of the old Grafton Flour Mill and the Cedarburg Woolen Company Worsted Mill--each of which is listed on the National Register of Historic Places. Indeed, along with the Bridge Street Bridge, the mills comprise the Mills of Grafton Historic District--a National Register-eligible resource. The district is on the west bank of the Milwaukee River, immediately to the west of which are a large parking lot and road (Fourteenth Street) that generally identify the location of the old mill race. West of the parking lot and road is an approximately twenty foot bluff, atop which is a residential area.

#### PART III. SOURCES OF INFORMATION

### A. Bibliography:

1. Primary or unpublished sources:

Bridge Street Bridge Plate.

- The Laws of Wisconsin... In the Year 1874. Madison: State of Wisconsin, 1874.
- Map of Ozaukee County, 1913. Delavan, WI: Hennessey & Company, 1913.
- Map of Washington and Ozaukee Counties. Milwaukee: G.V. Nash and M.G. Tucker, 1873.
- Milwaukee Sentinel. Various issues.
- Plat Book of Washington & Ozaukee Counties, Wisconsin. Minneapolis: C.M. Foote, 1892.
- Plat Book of Washington and Ozaukee Counties, Wisconsin. Des Moines: Northwestern Publishing Company, 1915.
- Polk's Wisconsin State Gazetteer and Business Directory, 1901-1902. Chicago: R.L. Polk & Co., 1901.
- Port Washington (Wisconsin) Weekly Star. Various issues.
- "Ready to Begin Work." Evening Wisconsin (city not known). 24 September 1892.
- Wisconsin Bridge and Iron Company. Articles of Incorporation. Corporation Division, Secretary of State, Madison, WI.
- Wisconsin State Gazetteer and Business Directory, 1879. Milwaukee: William Hogg, 1879.
- Wright's Directory of Milwaukee, 1887. Milwaukee: Alfred G. Wright, 1887.
- Wright's Directory of Milwaukee, 1909. Milwaukee: Alfred G. Wright, 1909.
- Wright's Directory of Milwaukee, 1910. Milwaukee: Alfred G. Wright, 1910.
- 2. Secondary and published sources:
  - Grafton Wisconsin: A Story of Industrial Progress. Grafton, WI: The Village of Grafton, 1952(?).

- Hess, Jeffrey, Frame, Robert M., III, Newbery, Robert S. and Vogel, John N. "Bowen Mill Bridge." Historic American Engineering Report, HAER No. WI-67 (1992). On file at the Library of Congress, Washington, D.C.
- History of Washington and Ozaukee Counties, Wisconsin. Chicago: Western Historical Company, 1881.
- "New Leader At Steel Firm." 31 January 1973. Clipping file: "Wisconsin Bridge and Iron Company." On file at the Milwaukee County Historical Society, Milwaukee, WI.
- Wyatt, Barbara, ed. Cultural Resource Management in Wisconsin. Vol. 2.

  Madison: State Historical Society of Wisconsin, Historic Preservation Division, 1986.

Prepared by:

John N. Vogel, Ph.D. Heritage Research, Ltd. N89 W16785 Appleton Avenue Menomonee Falls, Wisconsin 1 July 1996

#### PART IV. PROJECT INFORMATION

This project was sponsored by the Wisconsin Department of Transportation. Graef, Anhalt, Schloemer & Associates, consulting engineers in Milwaukee, Wisconsin, formally acted as the contracting agency. The project was directed by Dr. John N. Vogel, Principal Investigator and Sr. Historian for Heritage Research, Ltd. (HRL), who provided the photographic documentation and the architectural/technical data. He also edited and prepared the final document. The general truss bridge context was originally prepared by Jeffrey Hess, Robert Frame, III, and Robert Newbery in a report for the Wisconsin Department of Transportation (WisDOT), while the material on the Wisconsin Bridge and Iron Company was originally prepared for the WisDOT by Dianne Kromm. That WisDOT material was edited and summarized by Dr. Kevin Abing, who also prepared the local contextual information.

BRIDGE STREET BRIDGE HAER NO. WI-92 Page 13

